

BENCHMARKS

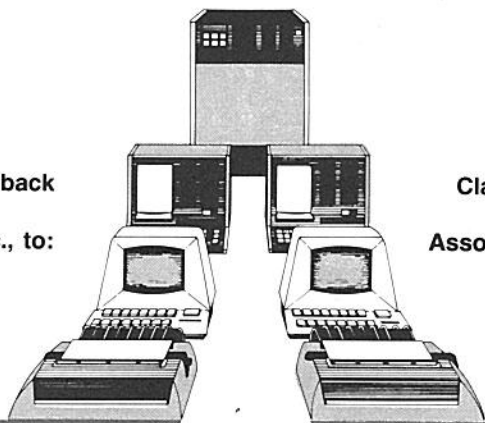
VOLUME 7 NUMBER 9 NORTH TEXAS STATE UNIVERSITY SEPTEMBER/OCTOBER 1986

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BENCHMARKS Reader/User feedback is encouraged.

Send all letters, suggestions, etc., to:
North Texas State University
The Computing Center
NT Station, Box 13495
Denton, Texas 76203



Claudia Lynch, BENCHMARKS Editor
Richard Harris
Associate Vice President of Computing
Thomas Wm. Madron
Manager, Computer Services
Robert G. Brookshire
Manager,
Academic Computing Services

SERVICES AVAILABLE TO USERS OF THE NTSU COMPUTING FACILITIES

The NTSU Computing Center is located in the Information Sciences Building (ISB), Room 119. Phone

Numbers: Computing Center: (817) 565-2324; Help Desk: 565-4050; Graphics Lab: 565-3479

Benchmarks Questions/Contributions, Etc.- Claudia Lynch

Information & ID-Codes; Disk Space Problems- Carolyn Goodman

Statistical/Research Support- George Morrow, Scott Barber, Claudia Lynch, Tim King, Panu Sittiwong

Academic ADABAS/COM-LETE; CRSP & COMPUSTAT Problems- Telka Clem

Student Programming Problems- CSCI Dept., GAB Room 542A; BCIS Dept., BA Room 152

JCL Problems; Password&Operating System Problems; Communication/Terminal Problems- Help Desk

Data Entry; Test Scoring & Analysis- Betty Grise

Administrative Applications- Coy Hoggard; **Printout Retrieval-** RJE Operators

DIALING UP NTSU COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are: 300/1200 BAUD: (817) 565- 3300; 3499

300 BAUD: D/FW METRO 429-6006 1200 BAUD: D/FW METRO 429-9314

The numbers that will accept either 300 or 1200 baud communications have an autobaud feature that requires you to hit the (RETURN) key repeatedly so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, the # prompt will appear on your screen and you can enter one of following CALL commands to connect with the computer of your choice.

CALL 8040 connects with the NAS/8083 (does not support full screen editing)

CALL 3270 connects with the NAS/8083 through a 3270 protocol converter (supports full screen editing).

CALL DEC connects with the VAXcluster; CALL 780 connects with the Research VAX

CALL 2000 connects with the HP-2000

NTSU CABLE SYSTEM SCHEDULE

The current configuration of the NTSU cable system is as follows:

Channel 7-NT Daily. Broadcasts from the NTSU Journalism Department.

Channel 8-TAGER. Broadcasts go to and from NTSU to other links in this microwave network.

Channel 10-NTSU Computer System Status Monitor (SSM). Displays the current status of the NAS, VAX and HP computer systems supported by the Computing Center.

Channel 12-Sammons Cable. Carries Cable News Network (CNN) unless a special program is requested.

Special broadcasts to and from classrooms can be arranged by the Media Library (565-2484).

HOURS FOR NTSU COMPUTER ACCESS AREAS: FALL 1986*

Days	Times	Location
Sunday	2-10 p.m.	ISB 110 Terminal Area
	Noon-Midnight	Computing Center RJE
	2-11 p.m.	GAB 550C
Saturday, Sunday	Noon-11:45 p.m.	College of Business
	Noon-5 p.m.	Graphics Lab
Monday	7:00 a.m.-Midnight	Computing Center RJE
Tuesday-Saturday	7:00 a.m.-Open 24 hrs/day	Computing Center RJE
Monday-Thursday	7:30 a.m.-Midnight	ISB 110 Terminal Area
	8:15 a.m.-11:45 p.m.	College of Business
	8 a.m.-Midnight	GAB 550C
	8 a.m.-10 p.m.	Graphics Lab
Friday	7:30 a.m.-6 p.m.	ISB 110 Terminal Area
	8:15 a.m.-7:45 p.m.	College of Business
	8 a.m.-8 p.m.	GAB 550C
	8 a.m.-6 p.m.	Graphics Lab
Saturday	9 a.m.-6 p.m.	ISB 110 Terminal Area
	CLOSE Midnight	Computing Center RJE
	10 a.m.-8 p.m.	GAB 550C

* Hours may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

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How to get HELP !!

By Scott Barber, Help Desk Coordinator (AC10QNTSMUSIC)

For those of you who are new to NTSU computing (and for those of you who have been wandering aimlessly for an increasingly extended period of time), you will be pleased to know that there are numerous sources available to help you accomplish your computing tasks. Part of your "initiation" involves learning where to find help for different types of problems.

There are basically four sources of help on the computing systems here, 1) written documentation, 2) on-line documentation, 3) consulting, and 4) the grapevine. Depending upon the type of problem you have, you should look to different sources to find out what you need to know.

There is both written and on-line documentation on both the VAXcluster and the NAS/8083 system. Manuals are available in large quantity in the BA first floor, in the GAB 5th floor, and the ISB library terminal areas. Manuals in the BA are mostly IBM oriented, while the other two rooms have documentation on both types of systems.

On-line documentation can be accessed on the VAX by typing **HELP** at the **Q** prompt. A list of help topics is displayed which takes you into the information you ask for at the "TOPIC?" prompt. On the MUSIC operating system on the NAS mainframe, enter **HELP TOPICS** at the *GO prompt for a list of available information.

Particularly useful for persons running batch jobs via OS/MVS is **HELP OPER(ations)**. This is an extensive set of help files detailing many different aspects of the batch environment, including how to set up JCL for different types of mainframe software, how to access different "fonts" (character sets) on the laser printer, etc.

There are consulting services available in the three terminal access areas to help you with logon, editing, and batch submission procedures. Often, they will point you toward appropriate documentation to help you find out what you need to know. (As you will discover, the ability to judiciously sift through documentation will coincide with your success on the computer.) You must also be aware that there are differences in the type of questions that different consultants are allowed to answer.

There are programming consultants in the GAB and the BA to help you with class assignments. These persons have been authorized by their departments to help you with you "homework." Please do not ask the Help Desk consultants in the ISB 110 to help you debug your programs. They are not authorized for this type of help. However, they can help you with many other types of problems, including moving your data from MUSIC to disk, SAS and SPSS setups, communications from NTSU terminals or from PCs at home, etc. This is also the place you should call if you believe there is a problem with the mainframe or the Local Area Network. If they cannot help you themselves, they may either pass the word along to appropriate Computing Center staff, or take your name and number and someone will get back to you.

All of the types of help on computing are geared toward helping you increase your ability to find the answers you need to use computers to accomplish whatever task you are involved in. With "patient persistence," you'll be fine.

ACADemic DASD Now 3380 Type Devices

The 3350 type disk drives that have provided academic IBM-compatible data storage for the past several years have been replaced by 3380 type devices. The transition from the 3350s to the 3380s has been smooth, and in most cases transparent to users. It is important, however, that you be aware of this change and some of the implications that it has for your use of these DASD as storage mediums.

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First of all, obviously, if you have an application that requires you to enter the device type, you must put 3380. Secondly, and probably most importantly, although the 3380s can provide expanded storage capacities as compared to 3350s, it is not a foregone conclusion that this will occur. In fact, it is actually possible to store data on the 3380s in such a way as to make them less efficient than the 3350s. To make sure this does not happen, please read the following information carefully.

3350 -vs- 3380: DISK CAPACITY

	3350	3380
Cylinders per volume :	555	885
Tracks per cylinder :	30	15
Tracks per volume :	16,650	13,275
Bytes per volume (MB)- [at maximum blocksize]:	317.5	630.24
Maximum block size :	19,069	47,476 (32,768 under most operating systems)

Example Block Size Comparisons

3350			Block Size Specified	3380		
Blocks per Track	MB per Volume	MB per Volume		Blocks per Track	MB per Volume	MB per Volume
1	16,650	317.5	(1) maximum	2	26,550	623.3
2	33,300	301.0	(2) 9040	5	66,375	600.0
2	33,300	247.8	(3) 7440	6	79,650	592.6
3	49,950	307.7	(4) 6160	7	92,925	572.4
4	66,600	272.8	(5) 4096	10	132,750	543.7
15	247,750	255.7	(6) 1024	31	411,525	421.4
27	449,550	230.2	(7) 512	46	610,650	312.7
72	1,198,800	95.9	(8) 80	83	1,101,825	88.1

Notes on Block Size Specified:

- (1) The maximum block size on a 3350 is 19069; the maximum good block size on a 3380 is 23476.
- (2) This is a good block size for 80 byte records (113 per block) when the device type might be either 3350 or 3380. However, it is not so good for a PDS with lots of relatively small members, since much space can be wasted internal to the PDS.

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- (3) Similar to (2) above, with 93 records per block.
- (4) Similar to (2) and (3) above, with 77 records per block. It is better than (3) in disk space usage and better than (2) for a PDS with small members (potentially less internal waste).
- (5) This is a common system block size (paging, SMF, etc.)
- (6) This is a common system block size and is often specified for load modules created by LKED. Note that it is very inefficient on a 3380.
- (7) (8) These are examples of how badly space can be wasted with small block sizes, particularly on a 3380. At 512, a 3380 has about the same space used in a well-blocked 3350. At 80, a 3380 provides less space than a 3350, even when the 3350 is also blocked at 80. The moral: always use moderate to large blocks, particularly on a 3380.

MUSIC/SP Upgraded

MUSIC/SP was upgraded to release 1.1 on September 7, 1986. This release was created primarily for maintenance purposes (to correct known errors in version 1.0), but the following changes/enhancements are noteworthy:

New Version of PCWS - If you have an IBM PC or compatible, you can use PCWS as a communication utility to access MUSIC/SP from your PC. The new version is 1.1, and you can get a copy of it by bringing a formatted 5 inch floppy diskette to the Computing Center (ISB 119). Please attach an external label to the diskette containing the following information:

PCWS 1.1 DATE-IN (mmddyy):

Your Name

Your ID-Code

NOTE: PCWS has been re-designed and includes an enhanced EXEC facility.

Multiple Terminal Sessions - 3270 users now have the ability to create and manage several different sessions from one physical terminal.

REXX Command File Interface - Full Screen 3270 images created by the PANEL utility are now accessible to REXX command files.

Terminal Session Recording - It is now possible to record a terminal session and save it to a Save Library file (Qrec.000). Enter RECORD ON at *Go to start recording your terminal session. To stop recording, enter RECORD OFF.

NOTE: When recording is set on, all terminal input and output associated with application programs is added to the file (Qrec.00) except for I/O associated with full screen programs such as the Editor. System messages resulting from /STATUS commands are not recorded.

PF Keys with Non-Full Screen Applications - Program Function Keys can now be used when non-full screen applications are running. In addition, PF Keys can be redefined to retrieve previously entered non-full screen input to allow for convenient re-entry (PF12 by default).

IBM 3270 model 5 Now Supported - This terminal has 132 characters per line.

File Encryption Utilities Added - The utilities ENCRYPT and DECRYPT enable a user to encrypt a file to achieve an additional level of security.

Meeting Scheduling Facility Added to TODO - This facility helps you to organize a meeting by: checking the schedules of attendees, conference rooms, and equipment items for free time. You can also update these schedules and send a memo to each participant.

A new version of the MUSIC/SP manual will be available in the University Store sometime this semester. It will have complete documentation on all the features mentioned above. Until then, should you be unable to use any of these facilities and are unable to get adequate on-line help, please feel free to consult with the people at the Help Desk or in Academic Computing Services.

SPSS-X Bug, Printing Error Found

When using a SPLIT FILE command followed by a REGRESSION procedure, more than one regression equation cannot be estimated. If more than one regression is requested in the REGRESSION procedure,

through multiple /DEPENDENT statements, the program will stop processing and produce the message 'AN ERROR INVOLVING SYSUT4 HAS OCCURRED' and will stop processing. SPSS Techline says this will be fixed in the next release of the program, due out soon.

There was an error which occurred during the printing of some of the manuals that document the TABLES procedure. The erroneous text shows examples of output containing a \ (back slash) in the TABLE subcommand. This should be represented as an * (asterisk).

Assembler H Now Standard

By Lee Anne Smith, Technical Support Staff (SY10QNTSMUSIC)

Assembler H is now the default Assembler obtained when executing the following NTSU standard cataloged procedures.

Name	Function
ASMC	Assemble
ASMCL	Assemble and Link-edit
ASMCG	Assemble and execute
ASMCLG	Assemble, Link-edit and execute

Default Options:

The installation-defined options for "H" include: NODECK, OBJECT, LIST, XREF(SHORT), NORENT, NOTEST, NOBATCH, ALIGN, ESD, RLD, NOTERM, and LINECOUNT(55)

Options No Longer Applicable:

Several of the installation options which could be overridden for VS Assembler are not applicable to "H". These are:

ALOGIC - list conditional assembly statements as processed.

BUFSIZE - in open code, specify the minimum buffer size (790 bytes) for SYSUT datasets. This allowed larger programs to be assembled in a given region, but slowed assembly speed.

LIBMAC - macro definitions read from the macro libraries and any assembler statements following the logical END statement are listed after the logical end statement. (The logical end statement is the last end statement processed during macro generation.)

MCALL - list inner macro statements after their "outer" macro instruction.

MLOGIC - all statements of a macro definition processed during macro generation are listed after the macro instruction.

STMT - write out the statement number in the SYSTERM listing.

WORKSIZE - delimit the use of region space.

YFLAG- write IFO205 message and its severity code in the listing (when using Y-type relocatable constants).

These options have been functionally incorporated into Assembler H. Most pertain to the assembly listing format or assembler text buffering. As mentioned in last month's *Benchmarks*, "H" executes faster than VS partially due to changes in text buffering.

WRITING AN OBJECT DECK:

The option **LOAD** was available with Assembler F, and was replaced by **OBJECT** under VS Assembler. If specified, **NOLOAD** will override the **OBJECT** option to **NOOBJECT** for VS Assembler and Assembler H.

Under VS Assembler, **OBJECT** caused the object module to be written to a TEXT DD statement device. Under Assembler H it causes the object deck to be written to a SYSLIN device, which is renamed at NTSU to SYSGO.

DECK causes the object to be written to the SYSPUNCH device. To produce an object deck you need only to specify **DECK** because **OBJECT** takes effect by default.

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VS ASSEMBLER PROCS:

VS Assembler is still available. The procedures are:

Name	Function
ASMVC	Assemble
ASMVCL	Assemble and Link-edit
ASMVCG	Assemble and execute
ASMVCLG	Assemble, Link-edit and execute

Econometrics Package Updated

A new release of SHAZAM (Version 5.1) has been installed and is now the version that is accessed with the `// EXEC SHAZAM` line in your JCL. According to the documentation, SHAZAM is now easier to use, more comprehensive and has capabilities above and beyond those offered by earlier versions. Data can now be manipulated as matrices, vectors, or as single observations all within the same run. Programming with matrices is described as "simple," and the regression analysis is much more extensive than in the past. It is possible to obtain exact Durbin-Watson Statistics, Ridge Regressions, Weighted Least Squares, and Stepwise Regressions. Linear and Nonlinear Hypothesis Testing and Linear Restrictions are available on almost any regression command, including Systems of Equations, Two Stage Least Squares and Probit, Logit, and Tobit models. Temporary variables are automatically stored from the results of each regression, so they are available for further calculations. There is also a new regression command to do Maximum Likelihood Estimation of Non-normal Models. Divisia, Paasche, Laspeyres, and Fisher Price and Quantity are Indexes are said to be a snap in SHAZAM Version 5. The Version 5 manuals will be available in the University Store sometime in the near future.

Please address any questions or comments about this product to George Morrow (AS01@NTSMUSIC). The previous release of SHAZAM is still available and can be accessed with: `// EXEC SHAZAM46`

SAS Upgraded on OS/MVS

The latest version of SAS (5.16) has been installed and is what you with the `// EXEC SAS` in your JCL. If you have any problems or comments concerning this version of SAS, please contact the Academic Computing Services staff (565-2324).

A manual, entitled *Technical Report: P-146 Changes and Enhancements to the Version 5 SAS System* and dated April 1986, contains the documentation for all the updated functions and procedures. You are welcome to look through this manual, although it must remain in the Computing Center. Listed below, are some of the more noteworthy modifications outlined therein.

- Some ETS Financial Functions are now available from Base SAS. They are invoked in DATA step programming statements or in certain procedures such as COMPUTAB. These functions are: COMPOUND, DEP, DACC, INTRR, IRR, MORT, NETPV, NPV, SAVING.

- New Procedures - BASE SAS:

IDPLOT - generates printer plots of points, where each point is labeled by the value of a multi-character point identification variable. Four plotting methods are available that vary the trade-off between completely presenting the values of the point identification variable and accurately presenting metric distance information.

QPRINT - prints the values in a SAS dataset, using all or some of the variables. In many cases, QPRINT is more efficient than PROC PRINT. QPRINT provides greater control over the layout of the report than PRINT does, but it does not offer all of the features of PRINT.

MATIML - translates PROC MATRIX code to PROC IML code. This is significant because PROC MATRIX is being phased out and replaced by PROC IML. PROC MATRIX will not be included in subsequent versions of SAS.

- New Procedures - SAS/OR

TNETFLOW - solves Network Programming problems having side constraints. The Network Programming problem with Side Constraints can be viewed as either a Linear Programming Problem that has an

embedded network structure or a network flow problem that must also obey additional linear side constraints.

Key Punch Machines to Be Replaced

By Betty Grise, Data Entry Supervisor (AO13@NTSMUSIC)

Effective November 1, 1986 all the card punch machines in the Data Entry Department will be replaced by microcomputers connected with each other in a high performance local area network. Card image data will be entered through the use of a data entry software package called KeyEntry III. This package has already been in use in the Data Entry Department for several months and has performed very satisfactorily.

Both batch and on-line data entry services will continue to be provided. Batch service will be essentially a substitute for card entry services, with files transfers to any or all of the central computer systems. Batch service also includes the use of an NCS Optical Mark Scanner.

Batch data distribution will be handled in one of two ways. It will either be distributed to users through file transfers to the central computer systems or it will be saved on diskettes. The latter method would be the one of choice for users who wish to analyze or manipulate their data locally on a microcomputer.

Word processing services are available through the Data Entry Department for most faculty projects. Thesis or dissertation word processing is not accepted. NTSU policy also prohibits us from accepting work that is for an individual's outside employment or consulting.

BITNET Usage Guidelines

Adapted from Interface (Vol. 17 No. 6 - September 1986), the Newsletter published by University Computing Services, State University of New York at Buffalo.

The BITNET Usage Guidelines have been established by the BITNET directors to remind users of the intended purpose of BITNET. While BITNET has proven an extremely useful network for scholarly research and communication, it is not and should not be considered a secure network, and should not be relied upon for transmission of confidential or sensitive data.

- All use of BITNET must be consistent with its goal to facilitate the exchange of non-commercial information in support of a member institution's mission of education and research. Commercial use is strictly forbidden.
- All transmissions must originate or end at the node of a Class A, Class B, or Class C BITNET member. BITNET may not be used for communication between Class D (non-academic) members.
- Large files sent over BITNET may cause traffic problems. A large file will reach its destination, but will do so at the expense of many other users. Therefore, file transmissions are limited to 300,000 bytes (3,750 eighty-character records) regardless of the time of day. Files exceeding this limit may be divided into a number of smaller files of 300,000 bytes or less, and transmitted at appropriate intervals.
- Since interactive messages take precedence over all transmissions, extensive use of messaging can block the flow of BITNET traffic. Therefore, applications which make extensive use of interactive messaging capability, such as BITNET-based PVM software, are restricted to research use for designated computer center staff.
- Proprietary software may not be sent over BITNET.
- Random mailings (junk mail), casual contacts ("Who are you?" messages), and job solicitations are discouraged.

NAS/8043, 8083 Compared

By Claudia Lynch, *Benchmarks* Editor (AS04@NTSMUSIC) [Job statistics supplied by Bob Brookshire, Academic Computing Services Manager (AS03@NTSMUSIC)]

Most of you are aware by now that the NAS/8043 that provided IBM-compatible computing for the academic community has been replaced with a NAS/8083 dual processor. The NAS/8083 provides IBM-compatible computing for both academic and administrative users by functioning as two separate CPUs (equivalent to two NAS/8063s). You may have wondered how much computing speed was gained with this upgrade (academic computing capacity increased 80%).

One way to answer this question would be to look at the execution speeds of compute-intensive batch jobs. A SAS job that simulates the central limit theorem in statistics, for example, must take the mean of 10,000 samples, each of which has 1,000 observations. On the NAS/8043, this job executed in 14 minutes and 18 seconds. This same job, on the NAS/8083, required only 9 minutes and 37 seconds to run. Thus, the ACADemic portion of the NAS/8083 is one and one-half times faster than the NAS/8043.

LAN Upgrade Has Implications for Sytek Modem Users

Editor's Note: Anyone wishing to purchase Sytek modems should seriously consider beginning the process immediately. The University can save approximately \$5000 on the System 2000, described in this article, if we can get \$30,000 worth of orders for Sytek equipment by the end of November.

NTSU uses a broadband, cable television based local area network (LAN) for data communications. This LAN, called LocalNetTM 20, is manufactured by Sytek, Inc. All academic users and those administrative users who are not on the 3270 network must use the LAN to communicate between terminals, personal computers, and the central computer systems. These data communications are accomplished, in part, by the use of Sytek radio frequency modems. These modems are modulator/demodulator devices which translate the digital signals produced by personal computers and terminals into analog radio frequency signals so that these signals can be carried over the cable TV network. All of the central computer systems are equipped with these modems so that they may receive signals from terminals and personal computers.

It is necessary for anyone not on the 3270 network who wishes to communicate with the central computer systems from a location on campus to use terminals or personal computers which are attached to Sytek modems. The University provides terminals attached to modems in several locations around campus, but, in general, it is the responsibility of departments or researchers to purchase their own modems for use with personal computers. Many people have already done this, but regardless of whether or not you currently possess a Sytek modem, please pay special attention to the following information.

In keeping with their corporate policy of developing network solutions, Sytek Inc. has come out with a new comprehensive broadband LAN called System 2000. NTSU plans to purchase this product, which is upwardly compatible with the modems used on the LocalNetTM 20. Although this upward compatibility exists, it is important for current owners of Sytek modems as well as future purchasers of this product to be aware of this technological development.

NTSU decided to purchase System 2000 because of the performance features that are incorporated within it. These features may not be of much interest to those outside the data communications industry, but they represent a significant improvement in LAN architecture. The more noteworthy System 2000 features are:

- Accessing hosts using directory services.
- Each user port can be password protected.
- Thousands of user ports can be upgraded in about 30 seconds through the use of "broadcast download".
- Networking software utilizes distributed intelligence.
- Conforms to the IEEE 802.7 broadband LAN standard.

It is possible for departments or individuals who currently own Sytek LocalNetTM 20 modems to take full advantage of the System 2000 architecture by either purchasing a hardware upgrade for their modems or trading them in on the newer models now available. The upgrade, which is simply a replacement card that is inserted into the modem, costs \$400. Questions about upgrading modems should be directed to the Computing Center (565-2324).

Departments or individuals who wish to purchase a Sytek modem should make sure they are purchasing one that will run with the System 2000. The following modems are available (prices reflect 10

\$1,075.50

Sytek 2502 Packet Communication Unit - this enables up to two terminals or personal computers to communicate over the local area network.

\$3,960

Sytek 2532 Modular Packet Communications Unit -

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\$ 540

comes equipped with connections for up to eight terminals or personal computers.

Sytek 2522 Asynchronous Interface Card - provides expansion for Sytek 2532 MPOU to accommodate up to 32 terminals or personal computers.

Please contact the Computing Center (565-2324) if you have any questions about purchasing this equipment.

LocalNet™ 20 is a trademark of Sytek, Inc.

National Computer Graphics Association (NCGA) Conference and Exposition

The National Computer Graphics Association will hold its annual conference and exposition for 1987 in Philadelphia, Pennsylvania. The conference is scheduled to begin Sunday, March 22 and end Thursday, March 26. Programs will be presented on sixteen major application areas and more than 170 vendors will demonstrate their products. For more information call 1-800-225-NCGA or 703-698-9600, or write to:

Computer Graphics '87
National Computer Graphics Association
2722 Merrilee Drive, Suite 200
Fairfax, Virginia 22031

SAS Graphics Competition

The July issue of *Benchmarks* announced the 12th annual SAS Users Group International (SUGI) meeting to be held in Dallas February 8-11, 1987. The deadline for submission of abstracts for papers to be presented at SUGI 12 has already passed, but there is still time to enter the graphics competition. Entries will be accepted until January 15, 1987 for two categories, "Most creative use of the software" and "Best presentation of data," in two divisions: color and monochromatic. Judging is based on how artistically and effectively you state your point and how effectively you use the capabilities of the software and the device. Awards are presented for first place and honorable mention in each category in each division. Winning entries will be published in SAS Communications. The following rules govern the competition:

- One entry per person per category.

Each entry should be no larger than 11 x 17 inches, hard copy only. Entries should be clearly labeled with the author's name and the competition's category and division.

- The code used to create the display must accompany work (along with a sample of the data for work submitted to the second category).
- A one-page description of the entry explaining how the graph was generated and any possible applications is required with each entry.
- Attendance at the meeting is not required for entry in the competition.
- All materials become the possession of SUGI and will not be returned.
- Mail entries no later than January 15, 1987 to:

Tony Oña
SUGI 12 - SAS/GRAPH Software Competition
c/o FMC Corporation
Chemical Research and Development Center
Box 8
Princeton, N J 08540

Computing Center Staff Attends Meetings, Presents Papers

Tom Madron, Manager of Computer Services and Bob Brookshire, Academic Computing Services Manager attended the annual meeting of the American Political Science Association (APSA) in Washington, D.C. the last week in August. Madron and Brookshire both have Ph.D.s in Political Science and continue to pursue their interests in this field.

While at the APSA meeting, Dr. Brookshire presented a paper entitled "Microcomputer Graphics and Political Science Research." During this same month, Brookshire also had a paper presented to the Symposium of Models of Politics and Government at the Third International Conference on Systems Research, Informatics and Cybernetics in Baden-Baden West Germany. The paper, entitled "Survival in Congress: Statistical Models of Legislative Careers," was co-authored with Dean Duncan of Emory University and Eric Brown of the University of Wisconsin-Milwaukee, who presented the paper on behalf of his coauthors. This paper is particularly noteworthy because it received the Distinguished Symposium Award.

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Calling On-Line Bulletin Boards

By Scott Barber, Academic Computing Staff (AC10@NTSMUSIC)

If you have used microcomputers much, you have probably heard about connecting over phone lines to computer bulletin board (BBS) services. Depending on the board, you can get involved in many activities from playing adventure games to getting into elaborate discussions on Life, the Universe, and Microcomputers, to downloading free software for your PC. What you may not know is just what hardware, software, and knowledge you need to get into one of these "boards".

Essentially, all the hardware you need are microcomputer with a "serial" communications port, a modem, a connecting cable, and a phone. You will also need some software which enables your computer to act like a terminal that can talk to a remote mainframe or microcomputer.

The basics of telecommunications hardware and software are explained in the July and August issues of *Benchmarks* in articles by Dave Molta. It is assumed here that you have been able to correctly connect the various serial and phone cords to the PC, the modem, the phone, and the wall! Consult your modem manual for details.)

This article is concerned with the things you need to know to set up your system to connect with a remote BBS. This involves setting up your software, making the phone connection and setting up a terminal session on the PC, and getting logged on in a strange environment.

First of all, you will need to set up your software by setting the communication parameters. As if on a diplomatic mission, you need to clarify the ground rules to which both parties must agree in order to talk to each other understandably.

The most important parameters for this type of telecommunications are the Parity, Data Bits, Stop Bits, and Baud rate. Most BBSs assume a Parity setting of OFF or NONE, 8 Data bits, and 1 Stop bit. You may notice that these are the same settings recommended for communicating with the mainframes at NTSU. If you get into a remote system and receive a continuous series of unreadable characters, you might try changing these to 7 Data bits, 1 Stop bit, and MARK Parity.

The Baud rate (or transmission speed) is dependent upon the modem you have and also the modem on the remote system. Most BBSs now support 300 and 1200 baud speeds, primarily due to the relatively low cost of such modems. By the way, if you are in the market for a modem, seriously consider one with at least 300/1200 baud capability (see Dave Molta's article).

Most communications software available these days has menus which let you change these parameters easily, and store the values on disk for future use. While this process is usually fairly straightforward, it is a good idea to have the software manual handy for the first few times.

After adjusting the parameters correctly, you need to place the software into "terminal" mode. Many communications packages provide an automatic dialing feature, so that you don't even have to pick up a phone receiver. For such systems, you will need to "key" the remote phone number (usually onto a software generated screen menu) and then supply a command telling the software to do its thing.

If you don't have automatic dialing, you should place the software in terminal mode, pick up the phone, and dial the data number for the remote BBS. (If you have a Hayes-compatible modem and a touch-tone phone, precede the number with the ATDT command, e.g. ATDT1234567.)

Be careful not to dial a voice number unless you have been instructed to do so for validation of a new system ID, or are doing so at a reasonable hour of the day. Also be careful to call only during advertised hours. Many system operators (SYSOPS) have only one phone line, which is dedicated to their BBS only during evenings or weekends.

When the remote modem "answers" the phone, you should receive some indication that a connection has been made. Your modem may have lights for signaling the status of your session, and the "carrier-detect" (CD) light indicates that you have "received carrier" or made a connection with another modem.

Also, your computer may respond by changing windows, or spewing information from the other system.

If you receive a carrier, but do not receive anything on the screen, press the (RETURN) key quickly two or three times. This is a method used by some BBSs (e.g. TI-HOST in Dallas) to determine your baud rate.

At this point, you will probably be presented with introductory information on the BBS, including what privileges you have as a first-time user of the system, and how to "get around" on the board. You should also be told if you are expected to pay a fee for special privileges (such as software downloading and participation in discussion areas), if you have a limited amount of time on the system, and may request that you provide information such as your name, phone number, computer type, etc.

(The SYSOP asks for the personal information as a precaution against being unable to identify people with small minds from logging on and crashing his/her system, or uploading "trojan horse" software which may do same to users of the board. Most SYSOPs, however, will enthusiastically welcome you to their BBS if you express the desire and follow the "rules of the board.")

Help should be available on how to move from one "area" in the BBS to another, how to send messages to the SYSOP, how to set up the session for your particular computer and software (# of characters per line, # of lines per page, etc.), and how to access the download library (if any).

After you have successfully logged on to the board, you are ready to explore it and develop your own way of interacting with it. For me, much of the value of calling BBSs are the discussion areas and the download sections. If you are interested in calling such boards, feel free to participate in the discussions, and upload public domain software you have obtained. The SYSOPs and other users of the board will appreciate it.

Hardly Software: A User-Contributed Column

By L. Don Hardly

Salutations, bit-mongers! This column represents the first installment of a year-long series of programming escapades with a personal computer. The articles serve programmers of the Texas Instruments Professional Computer (TIPC) and relate Pascal routines designed specifically for that microcomputer. All software translates with the vanilla-flavored Turbo Pascal compiler, 3.0, for MS-DOS. If you're one of those IBM PC owners, read these columns with a sense of good humor; my opinion of Big Blue is disparaging, but do clones have to worry?

A few paragraphs about me, my background, and my vendetta. My name is Don, and I'm expecting to finish my classes at the end of this school year. I own a TIPC (pronounced "tipsy," please) and the Turbo Pascal compiler. Getting right to the point, the Turbo Pascal Reference Manual contains a rather upsetting chapter, imperiously called "IBM PC Goodies." For those of you who don't know, the TI microcomputer refuses to mate with most IBM PC software and expansion hardware. Writing decent Turbo Pascal software for the TIPC requires a programmer to investigate the TIPC Technical Reference to vent any IBM incompatibilities. Am I a man or a macintosh? Compatibility be shunned and damn the torpedoes,

I choose to fight against tyrannous Blue-bellies! I write my own set of Pascal "goodies" for my favorite non-compatible computer and compensate for IBM's threat of populist programming environments.

Don't get me wrong, I like Borland's Turbo Pascal compiler. Turbo became the most widespread compiler on Earth for all the best reasons: fast compilation, small memory requirements, useful Pascal extensions, and an unexpectedly low price. The real problem is IBM's curious popularity: a name brand with large expansion requirements, inferior video characteristics, and slower hardware than numerous compatible computers. In light of rumors that IBM will desert the smaller PCs for the upscale ATs, even IBM recognizes its own design flaws.

The TIPC flaunts design characteristics clearly superior to the IBM PC. The TIPC has a faster internal clock (5 MHz), a crisper CRT display (720 by 300 pixels), and the sturdiest hardware a government contract could request of a PC. Mike, my buddy at Texas Instruments, boasts that you could drop the TIPC off a desk and it would still work (he admits the casing and the CRT would shatter). I don't intend to test that claim, but I tend to believe it. Anyway, I've used IBM PCs numerous hours and they break down frequently, whether dropped or not. My TIPC has worked flawlessly for over two years without so much as a squeaky disk drive. A great machine, but the TIPC needs software. Thank goodness for tech manuals and valuable compilers. Let's get to working on a video procedure for the TIPC using Turbo Pascal.

Getting Color for the TIPC Out of Turbo

The Color Modes grow as the first piercing thorns in Chapter 19 of the Turbo Pascal Reference Manual. The TIPC's wonderful 720 by 300 pixel resolution on its color monitors (on both 13-inch and 9-inch CRTs) needs software support to accent its clear superiority. Turbo fails to give non-IBM users the TextColor() procedure and the associated TextBackground() procedure. All that beautiful screen laid out with no simple way to work it.

"What's a programmer to do?" You have two choices: 1) tell MS-DOS to change colors, or 2) dig into the Device Service Routine (DSR) for the TIPC's CRT. The MS-DOS Operating System manual explains the requirements for controlling video color, and Turbo uses this method easily. However, Turbo Pascal offers the standard procedure INTR(), allowing programmers to generate a software-controlled interrupt and submit instructions directly to the TIPC's CRT hardware. Filling the register packet, RegPack, with appropriate values permits Turbo Pascal's INTR() procedure to load interrupt service registers and flags; the hardware checks the registers and interprets the interrupt request.

"Is INTR() faster than going through MS-DOS?" You betcha! Understand the process this way: MS-DOS is software to give your machine some continuity with alien computer systems. You submit a standardized request to MS-DOS and MS-DOS "interrupts" the microprocessor for you. If, instead, you decide to interrupt the microprocessor yourself, your program bypasses MS-DOS (and computer compatibility) to do the same work sooner. Generating your own interrupts with Turbo's INTR() procedure gets faster results than MS-DOS.

Introducing the BozoColor() Procedure

If you want the TIPC to remain marginally compatible with the IBM PC, I have your software! If you intend to actually use this software, you must first apply whiteface, wear an orange wig, and attach a big, red ball to your nose.

Only clowns can use the BozoColor() procedure.

MS-DOS requires simple "escape sequences" from your software to initiate color control. The MS-DOS Operating System explains the sequences in the chapter on "Extended Screen and Keyboard Control." For example, the escape sequence ESC[31m gives you red text on a black background. The sequence ESC[36;5;4m gives you cyan text, blinking and underlined. The manual also shows sequences for reverse video, concealed text, or monochrome bold intensity. By submitting these escape sequences to the console in Turbo's Write() procedure, the same software will execute under MS-DOS on the DEC Rainbow PC, the IBM PC, the Compaq PC, and the Texas Instruments PC.

From Turbo Pascal, you change to cyan text by declaring, Write(#27, '[36m'). Magenta text in reverse video requires, Write(#27, '[35;7m'). The string of characters in the Write() statement determines

the color of the screen text. You could also declare this string to a constant as, `CONST GreenCRT:STRING[5] = #27'32m'`; allowing you to change to green-colored video with, `Write(GreenCRT)`; I think most freshman Pascal programmers could figure out a simple CASE statement to change to all the colors necessary. Listing 1 shows gives the source code for `BozoColor()`, a procedure design for general compatibility with the color mode procedures in the "IBM PC Goodies" chapter. To avoid redundancy, the software compensates for both the `TextColor()` and `TextBackground()` IBM options explained in the Turbo manual. The color constants identically match the Turbo manual; one extra constant compensates for the `TextBackground()` procedure. The following statements show valid calling statements:

```
BozoColor(Cyan);           (* cyan text *)
BozoColor(Blink + Magenta); (* blinking magenta text *)
BozoColor(Red + TextBackground); (* red text, reverse video *)
BozoColor(Yellow + Blink + TextBackground); (* guess! *)
```

"What's wrong with Listing 1?" Nothing really, except that calling the `BozoColor()` procedure costs more time than a direct interrupt call. You can easily test the efficiency of `BozoColor()` with a FOR loop to repeat the color change a few thousand times. Change the screen color 32000 times and time the run with, `FOR Counter := 1 to 32000 DO BozoColor(Cyan); (* 10 minutes *)`

Your computer requires over ten minutes to complete the loop request; only 51 iterations of the loop occur every second. By contrast, the next procedure I list finishes the test in less than half-a-minute.

Introducing the `TextColor()` Procedure

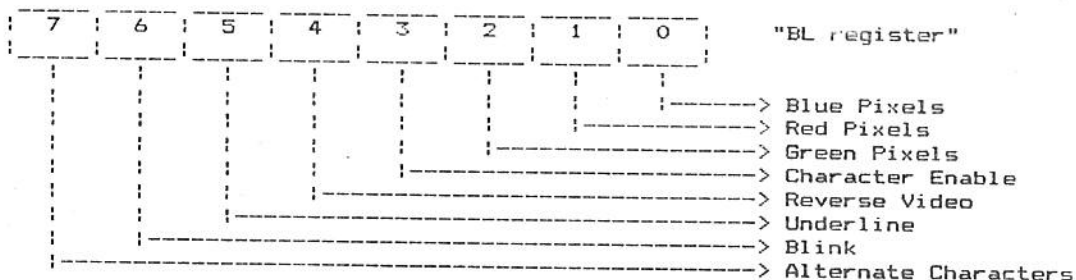
Why wait for the operating system software to flip those color switches? Dig into the hardware and flick 'em your yourself! Turbo Pascal offers a general `INTR()` procedure to give you direct software control over the interrupt vectors independent of MS-DOS.

Invoking a Device Service Routine (DSR) through Turbo's `INTR()` interrupt routine cozies you up to the silicone. Access the DSRs and use them for a greater performance advantage.

On the TIPC, hardware interrupt number 49H (the "H" suffix indicates a hexadecimal number) initiates the CRT DSRs. The 49H interrupt vector stays constant for CRT DSRs, while the sixteen-bit AX, BX, CX, and DX registers will adjust according to the specified DSR. Section 4.10 of the TIPC Technical Reference manual explains the eighteen CRT DSRs available through the 49H interrupt vector. Loading the AX register in the RegPack with different values initiates different DSRs, including color changes of the CRT. The BX, CX, and DX registers will determine and/or return CRT information from the screen hardware.

Section 4.10.15 of the *TIPC Technical Reference* gives details for setting attributes for the screen. Storing 1600H in the AX register initiates the attribute specification, while the BX register contains the specifications.

Without going into great detail, data loaded into the low-order byte of the BX register (called "BL") will determine the attributes for the CRT:



Simply set bits 0, 1, and 2 to the proper "red-green-blue" combination to ignite the desired text color. Reversing the video and blinking text involves setting only a few more selected bits.

Listing 2 shows the source code I've written to substitute for Turbo's TextColor() procedure. To reduce code size and avoid redundancy, I've incorporated features of Turbo's TextBackground() procedure into a my TextColor() software. My TextColor() procedure will execute only on a Texas Instruments PC. The color constants identically match the Turbo manual. My TextColor() procedure works identically to the BozoColor() procedure,

```
TextColor(Cyan);           (* cyan text *)
TextColor(Blink + Magenta); (* blinking magenta text *)
TextColor(Red + TextBackground); (* red text, reverse video *)
TextColor(Yellow + Blink + TextBackground); (* guess! *)
```

"How fast is Listing 2?" Glad you asked! Executing the same test for TextColor() as I did for BozoColor() requires only minor changes in the test program. The FOR loop repeats the same color changes 32000 times: **FOR Counter := 1 to 32000 DO TextColor(Cyan);** (* 18 seconds *) The TIPC needs only eighteen seconds to complete the loop request; about 1775 iterations of the loop occur every second. Recalling that BozoColor() executes only 51 iterations per second, you don't need a math degree to figure out the significant performance gained from invoking your own interrupts.

I finally have a crisp, efficient "goodie" for my non-compatible microcomputer, ready for a Turbo Pascal include file. Looking through the rest of the CRT DSRs, I find several other interesting hardware features, including scrolling, cursor control, and other attribute adjustments. Some goodies would require little programming time.

Parting Comments From Don

Before logging off, I have just a few comments about ethics for people using the source listings in this column. The software is free, but credit for the code's authorship is not free. If you use these procedures in a class assignment, be sure to credit *Benchmarks* for the code. Most instructors will accept these simple enhancements as part of your class assignments, but claiming complete authorship violates NTSU's code of ethics. Be sure to put the statement "Adapted from *Benchmarks*" somewhere in the procedure's listing.

Now that I've scared you, use the software!

If you want to learn more about Turbo Pascal, consider joining with the folks in TurboSIG. As the largest ACM Special Interest Group at NTSU, I hope to visit with more members at the meetings than ever before. I find the meetings interesting. Somebody in the room can answer any question you have about Turbo Pascal. Support your local compiler.

Next Month's Hardly Software

Many "goodies" require little work. I'll list the source code for functions WhereX and WhereY next time. The procedures CursorOn and CursorOff aren't "goodies," but I'll add these useful enhancements to the next column. I will also discuss the basics for retrieving direct screen information from the CRT hardware. All this will lead up to windowing software in two months.

May all your bugs be insects.

LISTING 1: INCLUDE FILE FOR PROCEDURE BOZOCOLOR().

CONST

Black : INTEGER = 0;	DarkGray: INTEGER = 8;
Blue : INTEGER = 1;	LightBlue: INTEGER = 9;
Green : INTEGER = 2;	LightGreen: INTEGER = 10;
Cyan : INTEGER = 3;	LightCyan: INTEGER = 11;
Red : INTEGER = 4;	LightRed: INTEGER = 12;
Magenta : INTEGER = 5;	LightMagenta: INTEGER = 13;
Brown : INTEGER = 6;	Yellow: INTEGER = 14;
LightGray: INTEGER = 7;	White: INTEGER = 15;

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```
Blink : INTEGER = 16;
TextBackground INTEGER = 32;

PROCEDURE BozoColor(Color : INTEGER);
(* Author: L. Don Hardy, for Benchmarks.
Computer: Texas Instruments PC, under MS-DOS.
Compiler: Turbo Pascal
Changing colors through MS-DOS escape sequences. See the
"Extended Screen and Keyboard Control" chapter of the
MS-DOS Operating System manual for details about escape sequences.
*)
CONST
  ColorArray : ARRAY [0..7] of STRING[4] = (* escape sequences *)
    ( #27[30', #27[34', #27[32', #27[36', #27[31', #27[35', #27[33', #27[37');
  VAR ColorString : STRING[20];
  ReversText,
  Flashing : BOOLEAN;
BEGIN (* BozoColor *)
  IF (Color) = TextBackground THEN BEGIN
    Color := Color - 32;
    ReversText := TRUE;
  END
  ELSE ReversText := FALSE;
  IF (Color) = Blink THEN BEGIN
    Color := Color - 16;
    Flashing := TRUE;
  END
  ELSE Flashing := FALSE;
  IF (Color) LightGray THEN Color := Color - 8;
  ColorString := ColorArray[Color];
  IF ReversText THEN ColorString := ColorString + '7';
  IF Flashing THEN ColorString := ColorString + '5';
  Write(ColorString, "");
END (* BozoColor *);
```

LISTING 2: INCLUDE FILE FOR PROCEDURE TEXTCOLOR().

```
CONST
  Black : INTEGER = 0;
  Blue : INTEGER = 1;
  Green : INTEGER = 2;
  Cyan : INTEGER = 3;
  Red : INTEGER = 4;
  Magenta : INTEGER = 5;
  Brown : INTEGER = 6;
  LightGray : INTEGER = 7;
  Blink : INTEGER = 16;
  DarkGray : INTEGER = 8;
  LightBlue : INTEGER = 9;
  LightGreen : INTEGER = 10;
  LightCyan : INTEGER = 11;
  LightRed : INTEGER = 12;
  LightMagenta : INTEGER = 13;
  Yellow : INTEGER = 14;
  White : INTEGER = 15;
  TextBackground : INTEGER = 32;

PROCEDURE TextColor(Color : INTEGER);
(* Author: L. Don Hardy, for BENCHMARKS.
Computer: Texas Instruments PC, under MS-DOS.
Compiler: Turbo Pascal
Changes the color attribute of any succeeding text, black
background. See page 161 of the TURBO Pascal 3.0 User's
```


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Guide for instructions on use (except "TextBackground" enhancement).

Use "TextBackground" similar to the "Blink" constant.

See page 4-31 of the *Technical Reference Manual for the TIPC* for any information about interrupt \$49 and AH = \$16. *)

CONST

Color Array:

ARRAY[0..7] of INTEGER = \$08, \$09, \$0C, \$0D, \$0A, \$0B, \$0E, \$0F);

VAR

RegPack : RECORD (* assign local record *)
ax, bx, cx, dx, bp, si, di, ds, es, flags : INTEGER;
END;

Flashing,

ReversText : BOOLEAN;

BEGIN (* TextColor *)

IF (Color) = TextBackground) THEN BEGIN

Color := Color - 32;

ReversText := TRUE;

END

ELSE ReversText := FALSE;

IF (Color) = Blink) THEN BEGIN

Color := Color - 16;

Flashing := TRUE;

END

ELSE Flashing := FALSE;

IF (Color) LightGray) THEN Color := Color - 8;

WITH RegPack DO BEGIN

ax := \$1600; (* AH := 16H *)

bx := ColorArray[Color]; (* BL := attrib. *)

IF ReversText THEN bx := bx + \$10;

IF Flashing THEN bx := bx + \$40;

END;

INTR(\$49, RegPack); (* Section 4.10, CRT DSR information *)

END (* TextColor *);

```
*****
*
*   V A X E N   *
*
*****
```

It's Happening on the VAX

By Lee Harper, VAX Operator (AO17@NTSMUSIC)

Here are the recent additions/modifications, plus some of the things you may have missed if you were gone during the Summer:

• VMS 4.4 upgrade

On Monday, August 25, the VAX Cluster was upgraded from VMS Operating System version 4.3 to 4.4. For a description of known changes that will affect the general user, see the article, "VMS4.4 Upgrade", in this newsletter. This information is also available online by typing: **VMSV44** from the VAX dollar sign

(**\$**) prompt. This will display the contents of the file **SYS\$PUBLIC:VMSV44.DOC**. For a more lengthy list of new features, type **HELP NEWFEATURES**

- **New UTILITY menu**

To decrease system overhead, and to organize all our utilities, there is now a common point of entry for all system utilities which are unique to the NTSU VAX system. To run any utility that is not a part of the VMS operating system, you merely type **UTILITY** (UTIL for short). A menu will then be displayed on the screen to allow you to select the utility you want to run by using the arrow keys, then pressing **(RETURN)** to execute it. Commands that were already set up before this new utility menu (such as **PRT**, **SYSTAT**, **WHO**, etc.) can still be run by typing the command name, but some of the more obscure utility commands (such as **CHANGEMVSPW**, **CHRCONVERT**, etc.) will be phased out, executable only from **UTILITY**, or by the individual setting up his own symbol. All the utilities available in the **UTILITY** menu will be located in the directory **DRA0:[PUBLIC.UTILITY.MENU]**.

- **Function key definition utilities**

A utility that will setup 34 function keys for VT100-type and better terminals is available. It will define each of the keys on the numeric keypad to be a different DCL command that you can use by merely pressing the keypad key while at the dollar sign prompt. You can invoke the function key definitions by entering the **UTILITY** menu and selecting **KEYS**. The command **KEYS** has also been set up since some users may want to use it in their login initialization. After invoking the key definitions, press the **HELP** key ("Line Del" key on Televideo terminals, **F2** on Micro-terms, "+" key on TI-PCs, and **PF2** on VT100s). This should display a diagram of the keypad with the definitions written on each key. Also provided from the **UTILITY** menu is a command procedure named **DEFINEKEYS**, which will take you through a step-by-step query session to define your function keys as you want them, if you don't like the predefined settings that the **KEYS** utility provides. The **DEFINEKEYS** procedure will provide you with a key definition file and a keypad diagram help file. After you have used **DEFINE/KEY** commands, the key definition file will be easier to maintain manually, but the real value of **DEFINEKEYS** is that it constructs the graphic keypad help file to make use of function keys practical.

- **New HELP item - COMMUNICATION**

A new item has been added to the VAX system **HELP** utility, mainly for aid in telling others how to configure settings in order to communicate on dial-up LAN lines. Type **HELP COMMUNICATION** on the VAX for more information.

- **New SPELL utility**

SPELLCHECK (you can abbreviate to **SPELL**) is a proofreader which makes use of a default 90,000 word dictionary and optionally a personal dictionary to check spelling. **SPELL** asks for a file name that you wish to have checked. For more information, type **HELP SPELL**. Format: **SPELL filename**

- **New Terminal Server Software causes problem**

The new release of terminal server software causes problems for terminals that are configured for 7 character bits. Any terminal or communications software that are used with the Vax should be set for 8 character bits (sometimes called wordlength). However, the new software now allows the VAX to close your network session. No more escaping to the LAN and typing **DONE!**

- **File Version Limit Changed**

There is now a three-version limit placed on all files created on the VAX system at NTSU. Having no version limit (as before) lead to nearly-unlimited numbers of previous file versions piling up as you re-edit. The new limit only applies to files created after the change was made, not to versions of files that existed before the change.

Version limit refers to the number of files with the same file name and type that can exist in the directory at one time. You can still re-edit a file as many times as you like, but as you create new versions, all previous versions except the last two are automatically deleted. This saves you time in having to type the **PURGE** command so often, but it may take some time to get used to the 3-version limit if you were used to relying on unlimited back-versions.

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• Files moved to SYS\$UTILITY

A new directory (DRA0:[PUBLIC.UTILITY]) has been created along with a new logical pointing to it (SYS\$UTILITY). All system related files that are of no interest to users have been moved to this directory, many of them from the SYS\$PUBLIC directory. If some utility you are used to using is all of the sudden not working, first read NEWS, then let the operator know if you can't figure out why: it may be due to this file movement.

• VAX/VMS Pocket Guide

A VAX/VMS pocket guide, published by the NTSU Computing Center is available at the University Store for \$1.25. It is suggested as a reference for all beginning to medium-high experienced users of the VAX-cluster system.

• TALK utility

Try out the TALK utility. It is a utility that uses the SEND utility for easy communication between users. It is especially useful for slow and non-VT100 terminals. Just type TALK. Then type /HELP for information on use.

VMS 4.4 Upgrade

By Dwayne Springfield, VAX Operator

VAX users may be interested in the following changes to the VMS operating system that occurred with the version 4.4 upgrade.

RECALL Command Expanded:

Interactive utilities and layered products that use the VAX/VMS screen management software now enable the user to recall up to the last twenty command lines by using (CTRL)(B) or by using the UP-Arrow and DOWN-ARROW keys. Some VMS utilities that will have this feature are: MAIL, DEBUG, SHOW CLUSTER, EDT editor, and VAX TPU editor.

NEW VMS DCL COMMANDS:

CALL: transfers control to a labeled subroutine in a command procedure and creates a new procedure level.

GOSUB: transfers control to a labeled subroutine in a command procedure.

RETURN: terminates a GOSUB subroutine procedure. Returns control to the command following the calling GOSUB command.

SET SYMBOL/SCOPE: controls access to local and global symbols. Allows the user to treat symbols as being undefined. Keywords are: [No]Local [No]Global

SUBROUTINE & ENDSUBROUTINE: These two commands define the beginning and end of subroutines in a command procedure. The label defining the entry point to the subroutine must appear either before the SUBROUTINE command or on the same command line.

For more information on these commands see the DCL DICTIONARY or use the VMS HELP facility (type HELP).

DCL now permits a Hyphen in the file name, File type, and Directory fields of a file specification. Hyphens may also be used in a logical name that appears as an unpunctuated file specification.

VAX TPU/Editor:

Format of the section files has been changed. All section files must be rebuilt.

The default file type for a TPU session has been changed from GBL to TPU\$SECTION.

```

* * * * *
*           *
*   O P E R A T I O N S   *
*           *
* * * * *

```

Disk Backup Schedules

Backup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems on the NAS CPU and their contents is done once every two weeks at some low activity period over a weekend.

MUSIC/SP Backup Hours

A message will be sent to all users signed on to MUSIC/SP approximately 10 minutes before backups are begun. It will be in the form * * MUSIC SHUT DOWN AT XXXX AM - SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC/SP, enter HELP HOURS. The following backup schedule is currently in effect:

Tuesday	3 a.m. (for about 3 hours)	Weekly backup
Wednesday - Saturday	4 a.m. (for about 2 hours)	Daily backup
Saturday	Midnight (for about 2 hours)	Daily backup

PHOENIX Backup Schedule

PHOENIX is backed up weekly on Sunday night. The backup begins at midnight and lasts for approximately 30 minutes.

VAX Backup Schedule

Incremental backups of both VAX systems are performed Monday through Thursday at 4 p.m. Users do not have to log-off, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log-off, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done the third Tuesday of every month, in the afternoon, just before preventive maintenance. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shut down; watch the system log-on message for specific times and dates.

NOTE: No backups are taken on the weekends. Requests for restoration of files should be made via MAIL to the username OPERATOR. Your file can only be restored if it existed before the last backup was done.

NAS/8083 Dual Processor Performance Statistics for July

CPU	SYSTEM	Scheduled Operating Hours	Planned Maint. Hours	Planned Production Hours	Unplanned Maint. Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP3	744	0.00	744.00	5.35	738.65	99.3%
ACAD	MUSIC/SP	744	29.53	714.47	10.69	703.78	98.5%
ACAD	MVS/JES2	744	0.00	744.00	6.92	737.08	99.1%
ACAD	COMPLETA	744	0.00	744.00	8.74	735.26	98.8%
ADMN	MVS/JES2	744	0.00	744.00	7.70	736.30	99.0%
ADMN	COMPLETEA	305	0.00	305.00	8.15	296.85	97.3%
ADMN	ADABASA	744	14.79	729.21	11.88	717.33	98.4%

System Uptime=(Production Hrs. Achieved)/(Planned Production Hrs.)

Production Hrs. Achieved = (Planned Production)-(Unplanned Maint.)

Scheduled Operating Hrs. = (Planned Maint.) + (Planned Production)

BENCHMARKS

SEPTEMBER/OCTOBER, 1986

MUSIC/SP Planned Maintenance Hours include 18.95 hours for system backup and 10.58 hours for VM/SP3 system backup.

ADABASA'S Planned Maintenance Hours include 14.79 Hrs. for system backup.

The ACAD CPU achieved 100% uptime. The NAS/7360 DASD achieved 100% uptime. The NAS/7350 DASD achieved 100% uptime. The ADMN CPU achieved 99.5% uptime. The STC 8650 DASD achieved 100% uptime. The NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

ACAD CPU:

Miscellaneous

- | | |
|--|------------|
| 1. Undetermined causes for system restarts | 2.35 HOURS |
| 2. Emergency power down due to air handler bearing failure in 5th floor of the GAB | 3.75 |
| 3. MVS/JES2 system tuning/improvements | 4.40 |
| 4. VM/SP3 system tuning/improvements | 1.87 |

TOTAL 12.27 HOURS

GRAND TOTAL FOR ACAD 12.27 HOURS

ADMN CPU:

CPU, Tape, and Disk Subsystems (NAS)

- | | |
|---------------------------------------|------------|
| 1. Corrective maintenance on the CPU. | 4.09 HOURS |
|---------------------------------------|------------|

Miscellaneous

- | | |
|---|------------|
| 1. Undetermined Causes for System Restarts | 0.92 HOURS |
| 2. Emergency power down due to air handler bearing failure in 5th floor of the GAB. | 3.47 |
| 3. Power failure in ISB caused BYMPX 0 to fail. | 1.15 |
| 4. MVS/JES2 system tuning/improvements | 1.66 |
| 5. ADABASA shut down to process single jobs | 0.92 |
| 6. COMPLETA system down to process single jobs | 3.68 |

TOTAL 11.80 HOURS

GRAND TOTAL FOR ADMN 15.89 HOURS

NAS/8083 Dual Processor Performance Statistics for August

CPU	SYSTEM	Scheduled Operating Hours	Planned Maint. Hours	Planned Production Hours	Unplanned Maint. Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP3	744	0.08	743.92	0.38	743.54	99.9%
ACAD	MUSIC/SP	744	25.75	718.25	3.01	715.24	99.6%
ACAD	MVS/JES2	744	0.08	743.92	3.92	740.00	99.5%
ACAD	COMPLETA	744	0.08	743.92	4.35	739.57	99.4%
ADMN	MVS/JES2	744	5.06	738.94	5.74	733.20	99.2%
ADMN	COMPLETEA	308	0.00	308.00	2.43	305.57	99.2%
ADMN	ADABASA	744	25.38	718.62	14.80	703.82	97.9%

System Uptime=(Production Hrs. Achieved)/(Planned Production Hrs.)

Production Hrs. Achieved = (Planned Production)-(Unplanned Maint.)

Scheduled Operating Hrs. = (Planned Maint.) + (Planned Production)

BENCHMARKS

SEPTEMBER/OCTOBER, 1986

MUSIC/SP Planned Maintenance Hours include 16.78 hours for system backup and 8.98 hours for VM/SP3 system backup.

ADABASA'S Planned Maintenance Hours include 19.96 Hrs. for system backup.

The ACAD CPU achieved 100% uptime. The NAS/7360 DASD achieved 100% uptime. The NAS/7350 DASD achieved 100% uptime. The ADMN CPU achieved 99.7% uptime. The STC 8650 DASD achieved 100% uptime. The NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

ACAD CPU:

CPU, Tape, and Disk Subsystems (NAS)

- | | |
|---|------------|
| 1. NAS C.E. caused CPU to enter system loop when reconfiguring channel addresses. | 0.32 HOURS |
| 2. CPU stopped to channel in 7380 DASD | 0.08 |

TOTAL 0.40 HOURS

Miscellaneous

- | | |
|--|------------|
| 1. Undetermined causes for systems restarts. | 1.62 HOURS |
| 2. MUSIC was disabled after local 3203 Printer was switched to the ADMN computer system. | 1.53 |
| 3. MVS/JES System Tuning/Improvements. | 3.25 |

GRAND TOTAL FOR ACAD 6.80 HOURS

ADMN CPU:

CPU, Tape, and Disk Subsystems (NAS)

- | | |
|--|------------|
| 1. Relocate 7380 DASD to designated disk area. | 5.42 HOURS |
| 2. Corrective maintenance on the CPU | 1.90 |

TOTAL 7.32 HOURS

Terminal Control System (COMTEN)

- | | |
|--|------------|
| 1. Upgrade to existing 3690 TCU. | 0.77 HOURS |
| 2. Corrective maintenance on the CPU.4 | 0.83 |

TOTAL 1.60 HOURS

Miscellaneous

- | | |
|---|------------|
| 1. Undetermined causes for systems restarts. | 0.12 HOURS |
| 2. Power failures in ISB caused by BYMPX 0 to fail. | 3.56 |
| 3. MVS/JES2 System Tuning/Improvements. | 1.05 |
| 4. ADABASA shut down to process single jobs. | 9.67 |
| 5. COMPLETA System Tuning/Improvements. | 0.38 |
| 6. COMPLETA System Failures | 1.10 |

TOTAL 15.88 HOURS

GRAND TOTAL 24.80 HOURS

BENCHMARKS

SEPTEMBER/OCTOBER, 1986

NAS/8083 Dual Processor Performance Statistics for September

CPU	SYSTEM	Scheduled Operating Hours	Planned Maint. Hours	Planned Production Hours	Unplanned Maint. Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP3	720	0.00	720.00	1.09	719.91	99.8%
ACAD	MUSIC/SP	720	33.96	684.04	4.73	681.31	99.3%
ACAD	MVS/JES2	720	0.00	720.00	3.43	716.57	99.5%
ACAD	COMPLETA	720	0.00	720.00	4.25	715.75	99.4%
ADMN	MVS/JES2	720	0.00	720.00	1.05	718.95	99.9%
ADMN	COMPLETEA	266	0.00	266.00	2.76	263.24	99.0%
ADMN	ADABASA	720	11.77	708.23	2.20	706.03	97.7%

System Uptime=(Production Hrs. Achieved)/(Planned Production Hrs.)

Production Hrs. Achieved=(Planned Production)-(Unplanned Maint.)

Scheduled Operating Hrs. = (Planned Maint.) + (Planned Production)

MUSIC/SP Planned Maintenance Hours include 18.99 hours for system backup and 9.00 hours for VM/SP3 system backup.

ADABASA'S Planned Maintenance Hours include 11.77 Hrs. for system backup.

The ACAD CPU achieved 100% uptime. The NAS/7360 DASD achieved 100% uptime. The NAS/7350 DASD achieved 100% uptime. The ADMN CPU achieved 99.7% uptime. The STC 8650 DASD achieved 100% uptime. The NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

ACAD CPU:

Miscellaneous

- | | |
|--|------------|
| 1. Undetermined causes for systems restarts. | 0.90 HOURS |
| 2. MUSIC/SP System Upgrade and Tuning. | 6.74 |
| 3. MUSIC/SP System in Program Loops. | 4.71 |
| 4. VM/SP3 System Tuning/Improvements | 0.69 |
| 5. MVS/JES System Tuning/Improvements. | 0.22 |

GRAND TOTAL FOR ACAD 13.26 HOURS

ADMN CPU:

Miscellaneous

- | | |
|--|------------|
| 1. Undetermined causes for systems restarts. | 0.66 HOURS |
| 2. AWEIDA MC74 Terminal Controller Installation. | 0.25 |
| 3. MVS/JES2 System Tuning/Improvements. | 0.73 |
| 4. ADABASA System Tuning/Improvements. | 0.89 |
| 5. COMPLETA shut down to process single jobs. | 1.07 |
| 6. COMPLETA System Tuning/Improvements. | 0.38 |
| 7. COMPLETA System Failures. | 1.03 |

TOTAL 5.01 HOURS

GRAND TOTAL 5.01 HOURS

